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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/324,304	06/02/1999	ZHENYU WANG	CASE2	1360

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MENDELSOHN AND ASSOCIATES PC
1515 MARKET STREET
SUITE 715
PHILADELPHIA, PA 19102

EXAMINER	
BAYARD, EMMANUEL	
ART UNIT	**PAPER NUMBER**
2631	

DATE MAILED: 10/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/324,304	WANG, ZHENYU	
	Examiner	Art Unit	
	Emmanuel Bayard	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *40,41,43 and 44* is/are allowed.

6)☒ Claim(s) *1-12,20-24,28,30-32,37-39,42 and 45-52* is/are rejected.

7)☒ Claim(s) *13-19,25-27,29 and 33-36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This is in response to communication filed on 7/26/04 in which claims 1-52 are pending the applicant's amendments have been fully considered but they are moot based on the new ground of rejection.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5-8, 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 5 recites the limitation "the probability of correctly receiving" in line 2. There is insufficient antecedent basis for this limitation in the claim.

4. Claim 7 recites the limitation "the constellation design" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

Claims 6 and 8 are likewise rejected because they depend on a base rejected claim.

5. Claim 31 recites the limitation "the constellation design" in line 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 9-10, 20-24, 28, 30-31, 37, 42, 45, 47-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Bakke et al U.S. patent No 5,621,766.

As per claim 1, Bakke et al teaches a receiver for identifying a message based upon a received signal, the receiver comprising: a processor that generates a minimum threshold and a maximum threshold (see fig.4 element 260 and 280 and col.4, lines 8-23) representing a range for each of a plurality of possible message levels, wherein the sizes of the ranges are different for at least two of the message levels (see fig. 3 element I and Q and col.1, lines 52-67 and col.3, lines 32-35); and a comparator that identifies the message by comparing the received signal with the generated minimum and maximum thresholds (see col.4, lines 42-45).

As per claim 2, Bakke et al inherently includes wherein the minimum and maximum thresholds are a function of an interrelationship between noise and the message level.

As per claim 3, Bakke et al inherently includes wherein the minimum and maximum thresholds are a function of the interrelationship between digital impairment and the message level.

As per claim 4, Bakke et al inherently includes wherein the minimum and maximum thresholds are a function of the interrelationship between coherent noise and the message level.

As per claim 9, Bakke et al includes means for determining a distance d (l) between received signal levels, the distance d (l) having different values for a plurality of message levels (see fig.4 element 270).

As per claim 10, Bakke et al method of forming a constellation design having a selected number of message levels, the constellation design forming part of a receiver that identifies a transmitted message based upon a received signal, the method comprising: determining a minimum threshold and a maximum threshold representing a range for each of a plurality of possible signal levels (see fig.4 element 260 and 280 and col.4, lines 8-23), wherein the sizes of the ranges are different for at least two of the message levels; and calculating the distance d(l) (see fig.4 element 270 and col.4, lines 35-55) between the maximum threshold for possible signal level (l) and the minimum threshold for possible signal level (i+1).

As per claim 20, Bakke et al teaches a receiver for identifying a transmitted message based upon a received signal, the receiver comprising: a processor for generating a constellation design having a minimum threshold and a maximum threshold for each of a plurality of possible signal levels (see fig.4 element 260 and 280 and col.4, lines 8-23), the minimum and maximum thresholds for each possible signal level representing a range, wherein the sizes of the ranges are different for at least two of the possible signal levels; and a comparator (see col.4, lines 42-45) that identifies the transmitted message by comparing the received signal with the generated constellation design and that generates an output signal representative of the transmitted message.

As per claim 21 method of identifying a message based upon a received signal, the method comprising: receiving the signal (see col.2, line 30), providing a minimum threshold and a maximum threshold representing a range for each of a plurality of possible message levels (see fig.4 element 260 and 280 and col.4, lines 8-23), wherein the sizes of the ranges are different for at least two of the message levels, and identifying the message by comparing (see col.4, lines 42-45) the received signal with the generated minimum and maximum thresholds.

As per claim 22, Bakke et al inherently includes wherein the minimum and maximum thresholds are generated as a function of an interrelationship between noise and the message level.

As per claim 23, Bakke et al inherently includes wherein the minimum and maximum thresholds are generated as a function of the interrelationship between digital impairment and the message level.

As per claim 24, Bakke et al inherently includes wherein the minimum and maximum thresholds are generated as a function of the interrelationship between coherent noise and the message level.

As per claim 28, Bakke et al includes including the step of determining a distance d (I) (see fig.4 element 270) between received signal levels, the distance d (I) having different values for a plurality of message levels.

As per claim 30, Bakke et al inherently includes comprising the step of identifying whether the calculated distance d (I) > dmin, wherein <dmin represents a selected minimum value.

As per claim 31, Bakke et al inherently includes comprising the step of adjusting the constellation design such that the distance d (l) > dmin for all received signal levels in the constellation design.

As per claims 37, 42, 47 Bakke et al teaches a receiver for identifying a message based upon a received signal, the receiver comprising: a processor that generates a minimum threshold and a maximum threshold representing a variable range for each of a plurality of possible message levels in a single constellation design (see fig.4 element 260 and 280 and col.4, lines 8-23); a comparator (see col.4, lines 42-45) that identifies the message by comparing the received signal with the generated minimum and maximum thresholds, wherein the minimum and maximum thresholds are a function of an inter-relationship between noise and the message level.

As per claim 45, Bakke et al teaches a method of identifying a message based upon a received signal, the method comprising: receiving the signal, generating a minimum threshold and a maximum threshold representing a variable range for each of a plurality of possible message levels in a single constellation design (see fig.4 element 260 and 280 and col.4, lines 8-23); identifying the message by comparing (see col.4, lines 42-45) the received signal with the generated minimum and maximum thresholds; determining a distance d(l) (see fig.4 element 270 and col.4, lines 35-55) between received signal levels, the distance d(l) having different values for a plurality of message levels, and identifying whether the determined distance d(l) > dmin, wherein dmin represents a selected minimum value (see col.4, lines 14-16 and col.6, lines 65-67).

As per claim 48, Bakke et al inherently includes wherein the sizes of the ranges are different for at least two of the message levels.

As per claim 49, Bakke et al inherently includes wherein the distances d (i) are different for at least two different pairs of message levels.

As per claim 50, Bakke et al inherently includes further comprising the step of generating the minimum and maximum thresholds using transmitted training signals.

As per claim 51, Bakke et al inherently includes wherein the step of adjusting comprises removing from the constellation design a message level that gives rise to d (i) x dmin.

As per claim 52, Bakke et al inherently includes wherein the sizes of the ranges are different for at least two of the message levels.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 5, 11-12, 32-33, 38-39 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakke et al U.S. patent No 5,621,766 in view of Lane U.S. patent No 5,380,450.

As per claims 5, 11 and 32, Bakke et al teaches all the features of the claimed invention except generating the minimum and maximum thresholds define a range

wherein the probability of correctly receiving a selected signal exceeds a selected probability P0.

Lane teaches analyzing the probability density function wherein the minimum and maximum thresholds define a range wherein the probability of correctly receiving a selected signal exceeds a selected probability P0 (see abstract and figs. 2-4).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Lane into Bakke as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

As per claims 12 and 33, Bakke teaches transmitting data points to the receiver and recording the received signal (see col.1, lines 35-55 and col.2, lines 45-50). Furthermore implementing such teaching for identifying the probability density function would have been obvious to one skilled in the art as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

As per claims 38 and 46, Bakke et al teaches a receiver for identifying a message based upon a received signal, the receiver comprising: a processor that generates a minimum threshold and a maximum threshold representing a variable range for each of a plurality of possible message levels in a single constellation design (see fig.4 element 260 and 280 and col.4, lines 8-23), and a comparator that identifies the message by comparing (see col.4, lines 42-45) the received signal with the generated minimum and maximum thresholds.

However Bakke et al do not teaches wherein the minimum and maximum thresholds define a range wherein the probability of correctly receiving a selected signal exceeds a selected probability P0.

Lane teaches analyzing the probability density function wherein the minimum and maximum thresholds define a range wherein the probability of correctly receiving a selected signal exceeds a selected probability P0 (see abstract and figs. 2-4).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Lane into Bakke as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

As per claim 39, Bakke et al teaches a method of forming a constellation design having a selected number of (I) message levels, the constellation design forming part of a receiver that identifies a transmitted message based upon a received signal, the method comprising: determining a minimum threshold and a maximum threshold representing a variable range for each of a plurality of possible signal levels in the constellation design (see fig.4 element 260 and 280 and col.4, lines 8-23); calculating the distance d(I) between possible signal levels based upon the determined minimum and maximum thresholds (see fig.4 element 270 and col.4, lines 35-55)

However Bakke et al does not teaches wherein the determining step comprises the steps of: identifying a probability density function for each possible signal level Y, and identifying the minimum and maximum thresholds as the boundaries of a range in

the identified probability density function wherein the probability of correctly receiving a selected message level exceeds a selected probability P0.

Lane teaches identifying a probability density function for each possible signal level Y, and identifying the minimum and maximum thresholds as the boundaries of a range in the identified probability density function wherein the probability of correctly receiving a selected message level exceeds a selected probability P0 (see abstract and figs. 2-4).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Lane into Bakke as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

Allowable Subject Matter

5. Claims 13-19, 25-27, 29, 34-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 6-8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

7. Claims 40-41and 43-44 are allowed over the prior art of record.

8. The following is a statement of reasons for the indication of allowable subject matter: a means for calculating the mean value, Lev (I), within a selected range defined by a selected set of minimum and maximum thresholds as recited in claims 6, 13, 17,

34, 40-41, 44. Calculating a variable range Lmse (l) for each possible message level, Lmse (l) representing one-half the distance between the minimum and the maximum thresholds for each possible message level as recited in claims 25, 43.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bremmer et al U.S. patent No 5,671,250 teaches an auto-rate method for simultaneous transmission of voice data.

Cheng et al U.S. patent No 4,771,188 teaches an adaptive threshold.

Okuwaki U.S. patent No 5,315,405 teaches a binary circuit.

Wilstermann et al U.S. Patent No 6,145,491 teaches a method for detecting combustion knock.

Loke et al U.S. patent No 6,615,028 B1 teaches a system and method for selecting amplifiers.

Abe U.S. patent No 6,192,146 B1 teaches an image processing system.

Ciurpita et al U.S. patent No 6,516,068 b1 teaches a microphone expander.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM) Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Bayard
Primary Examiner
Art Unit 2631

10/6/04

EMMANUEL BAYARD
PRIMARY EXAMINER